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MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 2, 2017/2018

TSE2451 / TSR2701 – SOFTWARE REQUIREMENTS ENGINEERING
(All sections / Groups)

13 MARCH 2018
02:30 p.m. – 04.30 p.m.
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This question paper consists of 8 pages with 4 Sections only.

2. Attempt **ALL** questions. The distribution of the marks for each question is given.

3. Please write all your answers in this question paper.

Section A

Indicate whether each statement is TRUE or FALSE.

(10 marks)

Answer

1) There are three different kinds of requirements sources, namely stakeholders, documents and systems in operation.

2) Quality requirements are statements of services the system should provide.

3) Requirements templates provide a simple and easily understandable approach to reduce language effects when documenting requirements.

4) The subject facet comprises all system context objects which directly or indirectly interact with the system.

5) The syntax of a modeling language defines the modeling elements to be used and specifies the valid combinations.

6) The use of incompletely specified process words can mostly be avoided or kept to minimum if requirements are formulated using passive voice.

7) A requirement is agreed upon if its origin as well as realization and its relation to other documents can be retraced.

8) A goal is one of the requirements artefacts that expresses engineer's intentions and known solutions.

9) Validation of requirement artefacts aims at detecting defects in requirements.

10) Requirements management tools can be categorized in two ways, namely specialized tools and standard office applications.

Section B

Identify the choice that best completes the statement or answers the question.

(15 marks)

Answer

1) An example of a context object type (material object) is
   A. A document.
   B. An organization.
   C. A communication service.
   D. A business process.

2) During the requirements engineering process for an online database system, you find that data protection regulations do not apply, as the data processed by the system are anonymized. What will be influenced by this finding?
   A. The context boundary.
   B. The system boundary.
   C. System interfaces.
   D. Grey zone between system and system context.

3) In the development of a school library system, which of the following is an example of a system context object in the subject facet?
   A. Pupil user group.
   B. Meta-search engine.
   C. Magazine.
   D. Printer.

4) In the development of an online banking system, choose the correct match of system context object in the usage facet to its properties.
   A. Server – Maximum storage available.
   B. Customer user group – Average usage load.
   C. Customer – Identification.
   D. Account – Balance.

5) Identify which example below shows that a grey zone object becomes part of the system in the development of a college library system:
   A. To save costs, the check-out terminals should no longer be developed from scratch, but, if possible, reused. The existing terminals cannot be changed.
   B. To save costs, the check-out terminals should no longer be developed from scratch, but reused. It is unclear if existing terminals can be adjusted or not.
   C. It turns out that the re-used check-out terminals can be and should be changed.

     D. After checking the technical parts of the old workstations, it turns out that they can be reused as they are.

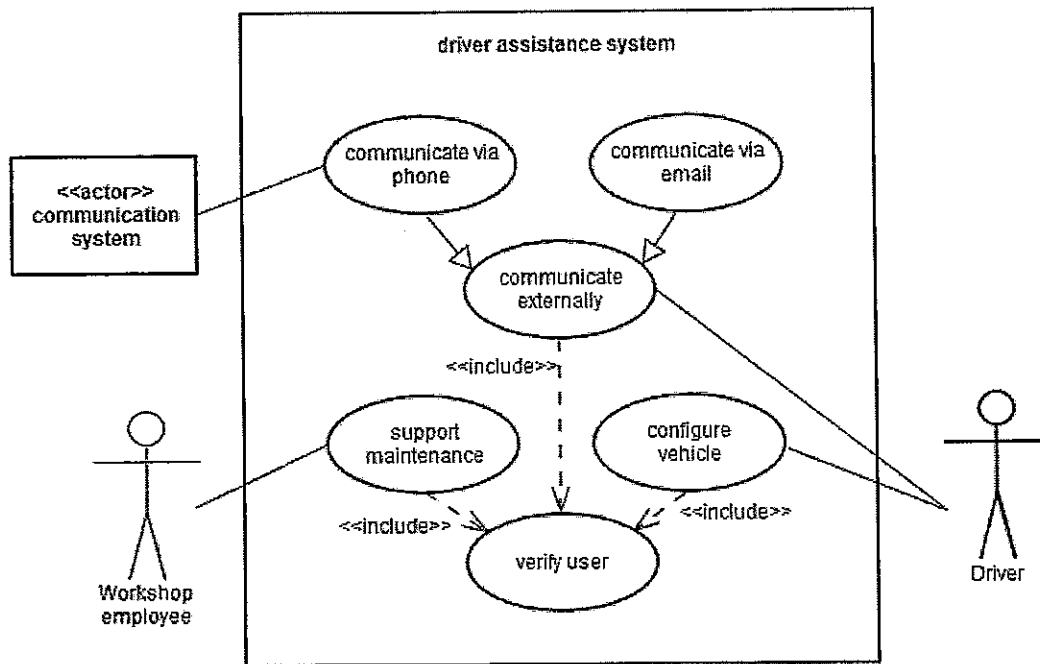*The following Figure 1 is a use-case diagram for driver assistance system.*

Figure 1

6) Identify the relationship between actor "driver" and use case "configure vehicle" in the Figure 1.
     A. Include relationship.
     B. Extend relationship.
     C. Generalization relationship.
     D. Communication relationship.

7) Which of the following is an external system that interacts with the system to be developed in the Figure 1?
     A. Configure vehicle.
     B. Workshop employee.
     C. Communication system.
     D. Driver assistance system.

8) Identify the actor interacts with the system during the execution of use case "support maintenance" in the Figure 1.
     A. Driver.
     B. Workshop employee.
     C. Driver assistance system.
     D. Communication system.

9) Which of the following statement best describes the include relationship in the Figure 1?

     A. The interaction steps documented in use case "verify user" are also contained in use case "configure vehicle".

     B. The interaction steps documented in use case "communicate via phone" are also contained in use case "communicate externally".

     C. The interaction steps documented in use case "communicate externally" are also contained in use case "communicate via email".

     D. The interaction steps documented in use case "support maintenance" are also contained in use case "configure vehicle".

10) Identify the relationship between use case "communicate via phone" and use case "communicate externally" in the Figure 1.

     A. Include relationship.
     B. Extend relationship.
     C. Generalization relationship.
     D. Communication relationship.

The following requirements are defined for a vehicle rental system.

R1: The vehicle rental system shall be able to notify the maintenance manager regarding the vehicle location.

R2: If a client has reserved the vehicle only temporarily, the vehicle rental system shall provide the client with the ability to cancel the reservation.

R3: During the processing at the day's end, the vehicle rental system shall print a list of reservation list.

R4: The vehicle rental system shall go into production in 2019.

R5: The vehicle rental system shall be available from 8am until 8pm every day.

R6: The vehicle rental system shall comply with the Personal Data Protection Act 2010.

Answer

11) Which of the following is a quality requirement?

     A. R1.
     B. R2.
     C. R4.
     D. R5.

12) Which of the following are functional requirements?

     A. R1 and R2.
     B. R3 and R4.
     C. R5 and R6.
     D. R2 and R6.

13) Which of the following requirement describes system activity as a [   ]
    service for the user?
    A. R1.
    B. R2.
    C. R3.
    D. R4.

14) Which of the following requirements contain certain logical or [   ]
    temporal conditions?
    A. R2 and R3.
    B. R4 and R5.
    C. R1 and R6.
    D. R4, R5 and R6.

15) Which of the following requirement describes an autonomous [   ]
    system activity?
    A. R1.
    B. R3.
    C. R5.
    D. R6.

Section C

1) Identify THREE relevant requirement sources for a car safety system.

(3 marks)

Answer

2) One of the validation techniques is review. Compare the different review techniques
   (Commenting artefacts, Walkthrough and Inspection) in terms of Effort, Suited for
   artefacts with high quality or Suited for artefacts with low quality; by completing the
   table below with 'Low', 'Medium' or 'High'.

(3 marks)

Answer	Commenting artefacts	Walkthrough	Inspection
Effort	Low to medium	Low to medium	
Suited for artefacts with high quality		Very low	
Suited for artefacts with low quality			

Continued...

3) Provide any THREE advantages of traceability on various aspects of the development process.

(3 marks)

Answer

4) Briefly explain the TWO risks of insufficient validation.

(2 marks)

Answer

5) The first process of change management process is 'Classification of the change request'. Provide FOUR other processes of change management process in the correct order.

(2 marks)

Answer

6) There are many different views when evaluating tools with regard to their adequacy to support requirements engineering. Explain how you would analyze the adequacy of a tool based on the following two different views: namely economic view and product view.

(2 marks)

Answer

Section D

1) Your company assigned you to validate a requirements specification. Describe how you would evaluate the requirements specifications using the following FOUR criteria: traceability, complete, consistent, and clear structure.

(4 marks)

Answer

Continued...

2) Draw an AND/OR tree that documents the hierarchical decomposition of the root goal "Easy navigation to destination". This root goal is refined into three sub-goals "dynamic route calculation with respect to traffic congestion", "comfortable destination input" and "comfortable route guidance". All three sub-goals must be met to consider the super-goal fulfilled. The sub-goal "dynamic route calculation with respect to traffic congestion" in turn is refined by two sub-goals "manual input of traffic conditions" and "automatic update of traffic data". Only one of the two-sub goals must be met to consider the super-goal met.

(6 marks)

Answer